

U.S. FISH AND WILDLIFE SERVICE SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

Scientific Name:

Platanthera integrilabia

Common Name:

White Fringeless orchid

Lead region:

Region 4 (Southeast Region)

Information current as of:

04/09/2012

Status/Action

Funding provided for a proposed rule. Assessment not updated.

Species Assessment - determined species did not meet the definition of the endangered or threatened under the Act and, therefore, was not elevated to the Candidate status.

New Candidate

Continuing Candidate

Candidate Removal

Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status

Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species

Range is no longer a U.S. territory

Insufficient information exists on biological vulnerability and threats to support listing

Taxon mistakenly included in past notice of review

Taxon does not meet the definition of "species"

Taxon believed to be extinct

Conservation efforts have removed or reduced threats

___ More abundant than believed, diminished threats, or threats eliminated.

Petition Information

___ Non-Petitioned

X Petitioned - Date petition received: 05/11/2004

90-Day Positive:05/11/2005

12 Month Positive:05/11/2005

Did the Petition request a reclassification? **No**

For Petitioned Candidate species:

Is the listing warranted(if yes, see summary threats below) **Yes**

To Date, has publication of the proposal to list been precluded by other higher priority listing?
Yes

Explanation of why precluded:

Higher priority listing actions, including court-approved settlements, court-ordered and statutory deadlines for petition findings and listing determinations, emergency listing determinations, and responses to litigation, continue to preclude the proposed and final listing rules for this species. We continue to monitor populations and will change its status or implement an emergency listing if necessary. The Progress on Revising the Lists section of the current CNOR (<http://endangered.fws.gov/>) provides information on listing actions taken during the last 12 months.

Historical States/Territories/Countries of Occurrence:

- **States/US Territories:** Alabama, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia
- **US Counties:**County information not available
- **Countries:**Country information not available

Current States/Counties/Territories/Countries of Occurrence:

- **States/US Territories:** Alabama, Georgia, Kentucky, South Carolina, Tennessee, Virginia
- **US Counties:** Calhoun, AL, Clay, AL, Cleburne, AL, Colbert, AL, Coosa, AL, Fayette, AL, Franklin, AL, Jackson, AL, Marion, AL, Randolph, AL, Talladega, AL, Tallapoosa, AL, Tuscaloosa, AL, Walker, AL, Winston, AL, Laurel, KY, McCreary, KY, Pulaski, KY, Whitley, KY, Greenville, SC, Bledsoe, TN, Cumberland, TN, Franklin, TN, Grundy, TN, Marion, TN, McMinn, TN, Monroe, TN, Polk, TN, Roane, TN, Sequatchie, TN, Van Buren, TN, Warren, TN, Lee, VA
- **Countries:**Country information not available

Land Ownership:

Exact percentages of land ownership have not been revised in several years, and must await a review of updated site (spatial) data from all appropriate state Natural Heritage Programs. These data were not

available for all states at the time of the 2012 update to this document. Therefore, approximate percentages are as follows: Federal (U.S. Forest Service, U. S. Fish and Wildlife Service, National Park Service) 20 percent, State (Kentucky Nature Preserves Commission (KSNPC), South Carolina State Parks, Tennessee State Parks and State Forests) 10 percent, and private 70 percent.

Lead Region Contact:

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TENNESSEE ESFO, Geoff Call, 931-528-6481, geoff_call@fws.gov

Biological Information

Species Description:

White fringeless orchid is a perennial herb with a light green, 60 centimeter (cm) (23 inches (in)) long, stem that arises from a tuber. The leaves are alternate with entire margins and are narrowly elliptic to lanceolate in shape. The lower leaves are 20 cm (8 in) long and 3 cm (1 in) wide. The upper stem leaves are much smaller. The white flowers are borne in a loose cluster at the end of the stem. The upper two flower petals are about 7 millimeters (mm) (0.3 in) long and the lower petal (the lip) is about 13 mm (0.5 in) long. The epithet *integrilabia* refers to the lack of any prominent fringe on the margin of the lip petal. The plants flower from late July through September and the small narrow fruiting capsule matures in October (Shea 1992, page 23).

Taxonomy:

White fringeless orchid was first recognized as a distinct taxon in 1941 when D.S. Correll described this plant as a subspecies of *Habenaria (Platanthera) blephariglottis* (Correll 1941, pages 153-157). C.A. Luer elevated the taxon to full species status in 1975 (Luer 1975, page 186). The currently accepted binomial for the species is *Platanthera integrilabia* (Correll) Luer.

Habitat/Life History:

Platanthera integrilabia grows in wet, boggy areas at the heads of streams and on seepage slopes. It is often associated with *Sphagnum* in partially, but not fully, shaded areas. Other common associates include: cowbane (*Oxypolis rigidior*), grass-of-Parnassus (*Parnassia asarifolia*), primrose-leaf stemless white violet (*Viola primulifolia*) and other orchids, particularly green wood orchid (*Platanthera clavellata*) and yellow-fringe orchid (*Platanthera ciliaris*)(Patrick pers. com. 2012).

Birchenko (2000, pp. 18-23, 47-48) analyzed genetic structure among 25 populations of *P. integrilabia*, distributed across Alabama, Georgia, Tennessee, and Kentucky. The majority (79 percent) of the genetic variation was present as variation within populations, while about 21 percent of the variation was attributable to differences among populations (Birchenko 2000, p. 29). While these results alone do not demonstrate that genetic variability in populations of *P. integrilabia* has been eroded by restricted gene flow, Birchenko (2000, pp. 34-40) cautioned that interactions between demographic and ecological factors could be a cause for some of the declines in *P. integrilabia* population sizes and could ultimately cause declines in the species genetic variation and increase differentiation among populations of *P. integrilabia*.

Historical Range/Distribution:

Platanthera integrilabia was originally known from Alabama, Georgia, Kentucky, Mississippi, North

Carolina, South Carolina, and Tennessee. The species has been extirpated from North Carolina (Henderson and Cherokee Counties), and a population has been extirpated from one county in Georgia (Cobb County). We previously have reported that *P. integrilabia* historically occurred in Virginia, but based on information from Townsend (pers. comm. 2012), we no longer consider Virginia to be within the historic distribution of this species.

Current Range Distribution:

The species currently occurs within the Appalachian Plateau Physiographic Province in Kentucky, Tennessee, Georgia, and Alabama; the Coastal Plain Physiographic Province in Alabama and Mississippi; the Blue Ridge Province in Georgia and Tennessee (Shea 1992, page 19); and primarily in the Piedmont Physiographic Province in Georgia. Unless otherwise noted, the following summary of the current distribution of known or presumed extant sites for the species is from Medley (1980), Shea (1992), White (1998, pers. com. 1999), A. Shea (pers. com. 1999), McCoy (2008, 2012), and Patrick (pers. com. 2012).

Alabama currently supports nine occurrences of *P. integrilabia* in the following counties: Calhoun (2), Claiborne (1), Clay (1), Jackson (1), Marion (2), Tuscaloosa (1), and Winston (1). The two sites in Calhoun County occur on the U. S. Fish and Wildlife Services Mountain Longleaf National Wildlife Refuge. The Claiborne County site occurs on lands managed by Talladega National Forest. The remaining sites in the state occur on privately owned lands.

Georgia currently supports eight occurrences of *P. integrilabia*, in the following counties: Bartow (1), Carroll (2), Chattooga (1), Cobb (1), Coweta (1), Forsyth (1), Rabun (1) and Stephens (1). The only federally owned site is in Stephens County on the Chattahoochee National Forest. All remaining sites occur on privately owned lands. Since 2000, one population was extirpated by inundation (construction of fishing pond) and one was newly discovered (Patrick pers. com. 2012).

Kentucky supports eight known extant occurrences and is the only state where a majority of the sites are under federal ownership. Five of the eight extant occurrences are located entirely on Forest Service land in the Daniel Boone National Forest (DBNF), and another occurrence lies partially within DBNF and partially on private land. One occurrence is located within a State Nature Preserve. One occurrence is entirely located on privately owned land. The following counties contain sites for the species: Laurel (3), McCreary (2 sites), Pulaski (2), and Whitley (1).

Mississippi contains two extant occurrences for the species, both in Tishomingo County (C. Norquist pers. com. 2007). We do not have current ownership information for these occurrences.

South Carolina contains a single occurrence, which was last observed in 2002 (South Carolina DNR 2012). This site is on land owned by the state.

Tennessee contains the majority of known sites across the species range, with 37 known or presumed extant occurrences distributed among the following counties: Bledsoe (3), Cumberland (1), Fentress (2) Franklin (7), Grundy (7), Grundy-Sequatchie County line (1), Marion (8), McMinn-Monroe County line (1), Polk (1), Sequatchie (1), Scott (1), Van Buren (3) and Van Buren-Warren County line (1). Three of the sites, two in Fentress and one in Scott County, are located within Big South Fork National Scenic River and Recreation Area, a National Park Service unit (McCoy 2012). Biologists from Tennessee Department of Environment and Conservation discovered two new occurrences during 2010 and 2011. Biologists with the Tennessee Valley Authority found one of the three Bledsoe County populations during a survey of a transmission line right-of-way (A. Datillo pers. com. 2010).

Population Estimates/Status:

Historically, there were at least 90 populations of *P. integrilabia*. Today the species is known or presumed

extant at some 50 sites across its range (NatureServe 2009). The majority of known sites consist of fewer than 100 plants, although some sites have been reported to contain 500-1000 plants at some point in their history. Reports of sites containing over 1000 plants are not unprecedented, but are rare.

Direct comparisons of historical and current population size estimates are difficult for the majority of known sites, in that observations are frequently reported as flowering stems one year, and vegetative plants the next, with many years elapsing in between observations made by different individuals. Also complicating direct comparisons within sites among years is the fact that conclusive identification of *P. integrilabia* requires flowers therefore vegetative counts (depending upon the observers familiarity with the species) may be suspect and could potentially include other species of *Platanthera* which sometimes co-occur with *P. integrilabia*.

Nonetheless, some apparent trends form the basis of sustained and some heightened concerns about the species status. In Alabama, declines have been reported at three of eight known sites, and a fourth has not been observed despite repeated surveys (A. Schotz pers. com. 2009; S. Miller pers. com. 2008). Four sites in this state have not been observed since the early 1990s (A. Schotz, pers. com., 2009); though, a new occurrence was discovered on private lands in Clay County in 2010 (A. Schotz, pers. com., 2011). In Kentucky, D. White (pers. com., 2005 and 2007) reported declines across most of the eight known populations in that state, often with no clear indication of what had caused the decline. In both years, White speculated that a combination of invasive plants, poor land use practices upstream or upslope, herbivory and drought may be affecting these populations. However, D. White (pers. com., 2009) later provided the following synopsis: while there is concern about the degrading habitat where these plants occur, the site ranks have not significantly declined [with the exception of] (one site); populations are at about the same level of viability as ten years ago.

Tennessee possesses a number of seemingly stable occurrences. However, most of the very large occurrences (in terms of numbers of flowering plants) have experienced a drastic decline. Many these declining occurrences reside in successional dynamic habitats such as power lines or logged areas. Although few of the mature forested stream-heads or seeps contain the number of plants compared to open sites, the forested seeps appear more stable long-term (McCoy 2012).

As of the 2012 update to this document, recent observation data were not available for the eight known sites in Georgia or for the site in South Carolina. The South Carolina was last observed in 2002, when one flowering plant was seen with many other nonflowering plants that were not diagnosable to species due to similarities with *Platanthera clavellata* (South Carolina DNR 2012).

Threats

A. The present or threatened destruction, modification, or curtailment of its habitat or range:

Shea (1992, pp. 25-28) reported that several *P. integrilabia* populations have been lost to habitat altering activities such as road construction, residential and commercial construction, and soil and site hydrology altering projects that reduced site suitability for the species. She estimated that these activities continued to threaten at least 50 percent of the remaining populations in 1992. Shea (1992, p. 28) concluded that all-terrain vehicles (ATVs) damaged or killed some plants at three sites in Tennessee, and identified ATVs as a potential threat at three additional sites across the species range. In Tennessee, three of 48 known occurrences have been extirpated from the construction of small private lakes (McCoy 2008, p. 3). Loss of sites to residential and other construction activities remains a potential threat to privately owned populations not managed for conservation.

The best available information indicates that many extant populations and their habitat are adversely affected

by factors that alter the vegetation communities, soils, and hydrology in the sites where they occur. These factors include right-of-way maintenance, timber harvesting, invasive species encroachment, and prolonged drought. White (1998, p. 3) notes that the recovery of this species will be dependent upon active habitat management rather than just habitat preservation. Because of the species dependence upon moderate to high light levels, some type of active management to prevent complete canopy closure is required at locations where vegetation succession appears to be a problem.

Several of the known populations are in or adjacent to powerline or road rights-of-way. Increased light availability in rights-of-way might enhance growth and reproductive output of *P. integrilabia*, but this positive effect is often short-lived due to encroachment of woody vegetation and aggressive grasses. High levels of competition could be affecting many of the sites where *P. integrilabia* occurs in utility rights-of-way, owing to a lack of canopy shading and the fact that repeated mowing of woody vegetation for right-of-way maintenance promotes extensive suckering and formation of a dense shrub stratum (A. Datillo, pers. com. 2011). Infrequent vegetation management using tractor-mounted mowing decks or herbicides in these areas, if carefully implemented, could benefit the species by periodically restoring adequate light levels to promote growth and reproduction. However, risks are associated with both types of management if they are not carefully planned and implemented. Potential adverse effects from mechanical maintenance include heavy soil disturbance and hydrologic alteration due to rutting caused by tractor traffic during wet periods. Indiscriminant use of herbicides could cause high levels of mortality to *P. integrilabia*, but this risk could be reduced by using herbicides that target only woody species or by timing herbicide application to minimize risk of exposure to *P. integrilabia* plants.

Most of the known Kentucky sites for the species occur in areas that are managed specifically for timber production (White 1998, pp. 1-3). Timber management is not necessarily incompatible with the protection and management of *P. integrilabia*. However, during timber operations, care must be taken to ensure that the hydrology of the bogs that support the species is not altered, that any heavy equipment used is kept out of the species habitat, and that the vegetation is managed in a manner that maintains suitable light and moisture conditions. Natural succession following timber harvests has been associated with reduced vigor, flowering, and reproduction in *P. integrilabia* populations, presumably due to altered light and soil moisture resulting from encroachment of woody species and grasses. D. White (pers. com. 2005) reported that five of 28 populations were declining apparently due to erosion of adjacent stream banks. This erosion appeared to have been caused by increase water flows from clear-cut areas upstream of the populations. The erosion seemed to have lowered the streambed which resulted in water moving off the sites supporting the plants more quickly resulting in drier sites.

Invasive nonnative plants such as Japanese honeysuckle (*Lonicera japonica*), kudzu (*Pueraria lobata*), and Japanese stilt grass (*Microstegium vimineum*) threaten several sites and, if left uncontrolled, can extirpate the species (Zettler and Fairey 1990, page 213;). These species, due to their aggressive growth habit and capacity for prolific reproduction, compete with *P. integrilabia* for sunlight, soil nutrients, and safe sites for seedling germination. Another exotic species affecting *P. integrilabia* populations and their habitat is feral hogs. The largest known population of *P. integrilabia*, located in the Cherokee National Forest in Tennessee, has suffered damage from feral hogs. The U.S. Forest Service erected an exclusion fence around much of this population, but this fence was found to be in disrepair in 2002 and approximately 50 percent of the flowering plants at the site had been uprooted. However, fence maintenance has been a priority at the site, and as of 2012 the fence continues to be effective in preventing hogs from accessing the *P. integrilabia* population (M. Pistrang pers. comm., 2012). In Georgia, disturbance from feral hogs has been reported from three sites and is considered a potential threat to three others (M. Richards pers. comm., 2013).

Standardized, routine population monitoring is lacking for the majority (> 99%) of sites across the species range. However, data from the respective state Natural Heritage programs suggests that sites can experience dramatic fluctuations in plant numbers, with sites reported to contain hundreds of vegetative or flowering plants one year, and fewer than a dozen (if any) plants in subsequent years. The fact that these observations have often been made by different observers and may represent varied levels of survey effort renders these

apparent trends difficult to interpret. Except for those circumstances where more obvious forms of habitat alteration, such as those discussed above, are present, most observers have attributed dramatic population fluctuations to drought.

B. Overutilization for commercial, recreational, scientific, or educational purposes:

Zettler and Fairey (1990, p. 216) report that poaching and legal collection for commercial and other purposes is a threat to *P. integrilabia*. Shea (1992, p. 27) reports that the species may have been extirpated from its type locality by collecting and previously, at least two Tennessee nurseries sold plants collected from wild populations. Because of the small size of many populations, collecting, even for scientific purposes, could easily extirpate the species from many areas; however, we do not have any current information on the imminence or magnitude of this threat.

C. Disease or predation:

Zettler and Fairey (1990, pp. 214, 216) stated that both herbivory and disease threaten this species. They reported herbivore damage to *P. integrilabia*, ranging from 11 percent to almost 24 percent of the plants present at the South Carolina and Georgia sites studied. They also noted plant damage caused by several fungal pathogens. White (1998, p. 2) reported that herbivory (primarily deer) continues to threaten the species at several sites, and that at one site it is threatened by wild boar rooting. Kentucky State Nature Preserves Commission (2010) reported substantial herbivory, presumably by deer, at the site in Francis Palk State Nature Preserve. Deer herbivory upon leaves lowers overall plant vigor, and when targeted at inflorescences will reduce or eliminate reproduction by seed. This is a potentially significant threat to *P. integrilabia* populations considering the low rates of successful sexual reproduction observed in the species (Zettler and Fairey 1990, pp. 212-216), the evidence that many populations have undergone long-term declines (McCoy 2008, p. 3), and the fact that deer herbivory has been noted at many populations (M. Richards pers. comm. 2013; McCoy 2012, p. 3).

D. The inadequacy of existing regulatory mechanisms:

Some of the sites supporting *P. integrilabia* are under the jurisdiction of state and federal wetlands protection regulations such as those developed under the Clean Water Act. However, because of their size and isolation from larger aquatic systems, most sites are not under the jurisdiction of these programs. Additionally, many of the activities that threaten the species would take place in areas adjacent to, rather than in, the bogs supporting the species and, therefore, are not subject to wetlands regulations regardless of the size or location of the wetland.

Of the states with extant populations of *P. integrilabia*, only Tennessee and Georgia have legislation that provides some protection for the species at the state level. The law that provides official protection to designated species of plants in Tennessee is the Tennessee Rare Plant Protection Act of 1985 (T.C.A. 11-26-201), which forbids persons from knowingly uprooting, digging, taking, removing, damaging, destroying, possessing, or otherwise disturbing for any purpose, any endangered species from private or public lands without the written permission of the landowner. The law that provides official protection to designated species of plants in Georgia is known as the Wildflower Preservation Act of 1973. Under this law, no protected plant may be collected without written landowner permission. No protected plant may be transported within Georgia without a transport tag with a permit number affixed. Permits are also used to regulate a wide array of conservation activities, including plant rescues, sale of protected species, and propagation efforts for augmentation of natural populations and establishment of new ones. No protected plants may be collected from state-owned lands without the express permission of the Georgia Department of Natural Resources. The Georgia Environmental Policy Act (GEPA), enacted in 1991, requires that impacts to protected species be addressed for all projects on state-owned lands, and for all projects undertaken by a municipality or county if funded half or more by state funds, or by a state grant of more than \$250,000. The provisions of GEPA do not apply to actions of non-governmental entities. On private lands, the landowner

has ultimate authority on what protection efforts, if any, occur with regard to protected plants (Patrick et al. 1995, p. 1 of section titled Legal Overview).

Because *P. integrilabia* receives no protection under state laws other than in Georgia and Tennessee, and these states laws protecting plants do not forbid destruction of plants on private lands with landowner consent, we conclude that inadequacy of existing regulatory mechanisms is a threat to the species.

E. Other natural or manmade factors affecting its continued existence:

Zettler and Fairey (1990, pp. 212-216) reported that only 2.8 percent to 4.6 percent of the plants within a population flower in any given year and of these, only 6.9 percent to 20.3 percent will set seed. This results in a very low production of seeds and, consequently, a limited ability to reproduce at most sites. Low reproductive potential combined with often small population sizes, likely contributes to low (potentially negative) population growth rates and increases potential for inbreeding depression and genetic bottlenecks. As noted above, herbivory (especially when targeted upon inflorescences, as is often the case) would further compound the threat of low reproductive potential and low seed set.

One factor contributing to declining population sizes could be that many of the populations are small and they are distributed into isolated patches of habitat, which could be less likely to attract pollinators. Birchenko (2000, p. 35) suggested that the higher rates of fruit set observed in larger populations (56 percent) (Zettler et. al. 1996, p. 22) compared to small populations (6.9 and 20.3 percent) (Zettler and Fairey 1990, p. 212) supported the presence of such a mechanism. Zettler et al. (1996, p. 22) hypothesized that higher fruit set observed in the McMinn County, Tennessee, population was probably a closer approximation of historical conditions when populations were larger and cross-pollinations were more frequent. A second possibility suggested by Birchenko (2000, p. 36) is that successful germination and establishment of *P. integrilabia* could be limited by dispersal of seeds into suitable sites where hyphae of appropriate fungal species are present to support a symbiosis that could be critical in the orchids early life cycle.

Conservation Measures Planned or Implemented :

The Calhoun County, Alabama, populations of this species are now part of the newly established Mountain Longleaf National Wildlife Refuge. This will provide permanent protection for these populations. However, the *P. integrilabia* population at one of these sites has not been observed (despite searches) in many years, and the other is notably reduced in number relative to historical levels. In January 2010, refuge staff manually removed understory vegetation (i.e., less than four inches in diameter) from a portion of one site in order to accommodate a search for unexploded ordnance (S. Miller, pers. com., 2010), which might prove beneficial to the *P. integrilabia* population.

The Nature Conservancy has registered one of the privately owned Grundy County, Tennessee, sites as a natural area. In 1980, this site supported 250 plants; however, the number of plants present in recent years has been greatly reduced, and Tennessee Heritage Program botanists have not observed flowering plants in nearly 15 years at this site. The largest known *P. integrilabia* population is located in the Cherokee National Forest in Tennessee in a site that is designated as a Botanical Area by the U.S. Forest Service (USDA 2008, pp. 53-55). The South Carolina site and 14 of the Tennessee sites are within state parks, forests, or wildlife management areas. This provides these sites with some degree of protection, but does not necessarily ensure that they will receive management that may be needed to maintain the species. The KSNPC recently purchased the privately owned Pulaski County site for the species and established a State Nature Preserve (D. White, pers. com., 2007). A study of the hydrology at the site has been initiated, and management has been undertaken to reduce woody stem densities and restore hydrology by constructing a small dam in the stream draining the site (T. Littlefield pers. comm. 2013). The U.S. Forest Service also purchased a Kentucky tract that supports *P. integrilabia* (D. White, pers. com., 2007).

The Service provided a grant to the KSNPC to develop site conservation plans for the higher quality *P.*

integrilabia sites that remain in existence. A report containing conservation plans for 29 sites was prepared by White (1998, pp. 1-106). The threats to most sites and the active management needs identified in this report indicate that long-term protection of *P. integrilabia* can best be achieved through the federal listing process. Although federally listed plants receive only limited protections on privately owned lands, federal listing would confer a number of added conservation benefits. Federally funded, permitted or authorized actions affecting this species or its habitat (even on private lands) would be subject to Section 7 consultation with the Service. As such, activities affecting streams or wetlands containing this species and requiring a U.S. Army Corps permit would either have to be redesigned to avoid impacts to the species, or undergo consultation with the Service to ensure that the species long-term viability is not jeopardized. Federal listing would also enable state agencies to compete for Section 6 Recovery Land Acquisition funding for the acquisition of properties containing the species and supporting its recovery.

Because *P. integrilabia* occurs in northeastern Mississippi, in 2009 staff from the Tennessee Natural Heritage Program searched potential habitats in the southern portion of Tennessee's Coastal Plain, specifically areas in Big Hill Pond State Park and Natchez Trace State Park and Forest. Although the species was not located in this area of Tennessee, staff identified suitable habitat and observed a number of plant species which are associated with *P. integrilabia*. Based on this inventory and other observations from the region, it is possible that populations exist in this region of Tennessee but have not yet been discovered (R. McCoy, pers. com., 2010).

In Georgia, one population is located on U.S. Forest Service land in Stephens County, and a population in Pickett County is located in a site that is under a conservation easement through the North American Land Trust. The Atlanta Botanical Garden has collected seeds, tubers, or seedlings from six populations in Georgia to establish *ex situ* conservation holdings of *P. integrilabia*, and has successfully cultivated plants from these collections (M. Richards pers. comm. 2013).

The U.S. Forest Services Southern Region supported the elevation of this species to candidate status and has offered to work with the Service in protecting the populations that occur on Forest Service lands. The Natural Heritage Programs and/or state Plant Protection Programs in Alabama, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia were all contacted concerning elevation of this species to candidate status. All supported this effort and offered their assistance in protective efforts in the future.

While light availability and soil moisture are factors widely thought to regulate growth and reproductive output of *P. integrilabia*, these ecological relationships have not been investigated. The Service is funding a study by researchers at the University of Tennessee in Chattanooga to investigate associations between in situ measurements of light and soil moisture availability and individual- and population-level growth and reproduction with for species. The research also will include non-destructive measurements of shade tolerance and water-use efficiency of *P. integrilabia* individuals in an attempt to elucidate optimal levels of light and soil moisture for growth and reproduction in this species based on its adaptive leaf-level physiology. Knowledge gained through this study should lead to the development of improved strategies for managing vegetation structure and composition in *P. integrilabia* habitat.

Summary of Threats :

Populations of *P. integrilabia* have been lost to habitat altering activities such as road construction, residential and commercial construction, and soil and site hydrology altering projects that reduced site suitability for the species (Shea 1992, pp. 25-28). Inundation of *P. integrilabia* due to construction of impoundments and impacts from ATV traffic have caused the loss of some populations. Loss of additional sites these factors and to residential and other construction activities remains a potential threat to privately owned populations not managed for conservation.

The best available information indicates that many extant populations and their habitat are adversely affected by factors that alter the vegetation communities, soils, and hydrology in the sites where they occur. These factors include utility and road right-of-way maintenance, timber harvesting, invasive species encroachment, and prolonged drought. One or more of these threats has historically impacted or is currently operating at the majority (likely more than 90%) of known occurrences across the species range. These factors, combined with the small sizes and low reproductive rates of many populations, leave the species vulnerable to localized extinctions throughout its geographic range.

We find that this species is warranted for listing throughout all its range, and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

For species that are being removed from candidate status:

_____ Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions(PECE)?

Recommended Conservation Measures :

Conservation measures are being implemented to protect the species in all states as outlined in previous sections. All states where the species is currently found supported the elevation of *P. integrilabia* to candidate status and the eventual federal listing as threatened or endangered. This species recovery will depend upon protecting additional populations through acquisition or landowner management agreements, implementation of actions such as canopy thinning (at sites where vegetation succession appears to be a problem), control of invasive exotic plant species that may compete with *P. integrilabia*, and rangewide monitoring to track population trends and responses to management actions. Further study to evaluate genetic structure within and among populations of *P. integrilabia* are needed in order to (1) assess the potential threats of inbreeding depression and genetic bottlenecks posed by small population sizes and low reproductive rates and (2) to evaluate whether human facilitated gene flow among populations could be warranted in an effort to increase cross-pollination and fruit set in order to offset population declines. .

Priority Table

Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/Population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/Population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/Population	9
	Non-Imminent	Monotype genus	10
		Species	11
		Subspecies/Population	12

Rationale for Change in Listing Priority Number:

Magnitude:

Reported threats include drought, road construction, residential and commercial construction, impoundments, incompatible timber operations, incompatible vegetation maintenance in powerline rights-of-way, all-terrain vehicles, herbivory (primarily by deer), feral hogs, stream bank erosion, invasive exotic plant species, poaching and other forms of collection, and unchecked vegetation succession leading to canopy and sub-canopy closure. One or more of these threats has been identified as a contributing factor in apparent population declines reported at sites across the species range (Shea 1992, White 1998, McCoy 2008 and 2012, USDA 2008). However, as noted above, available estimates of population size can be difficult to interpret because they have been made by different observers, are spaced several years apart, and/or represent inconsistent levels of survey effort (area covered per unit of time). At this time we continue to find this species in need of federal listing, but do not find that available data suggest permanent, precipitous declines in existing populations. Therefore, we have determined that the magnitude of identified threats is moderate.

Imminence :

Identified threats to the species currently are affecting or have adversely affected the status of the species throughout its range; therefore we find these threats to be imminent.

Yes No Have you promptly reviewed all of the information received regarding the species for the purpose of determination whether emergency listing is needed?

Emergency Listing Review

No Yes Is Emergency Listing Warranted?

The threats faced by this species are significant, however, it is not anticipated that a significant number of the known populations will succumb to (become extirpated by) these threats in the immediate future (next 1-2 years).

Description of Monitoring:

State agencies responsible for plant protection, the U.S. Forest Service and the Service monitor sites supporting the species when time is available for this activity. Funds specifically designated for range-wide monitoring are currently not available to the states or the Service.

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment:

Alabama, Georgia, Kentucky, South Carolina, Tennessee

Indicate which State(s) did not provide any information or comment:

none

State Coordination:

All states have provided comments at one point or another in subsequent revisions to this document. Alabama, Georgia, Kentucky, South Carolina, Tennessee, and Virginia provided comments during the 2012 assessment.

Literature Cited:

- Birchenko, I. V. 2001. Genetic diversity and microsite characterization of the rare monkeyface orchid, *Platanthera integrilabia* (Orchidaceae), in the southeastern United States. Unpublished M.S. Thesis, Ohio University. November 2001. 61 pp., including appendices.
- Call, Geoff. 2008. U.S. Fish and Wildlife Service, Cookeville, Tennessee. Personal communication with Robert Currie, U.S. Fish and Wildlife Service, Asheville, North Carolina. 2008.
- Correll, D. S. 1941. Two new American orchids. Harvard University Botanical Museum Leaflet 9:152-157.
- Datillo, A. 2011. Email to Geoff Call, U.S. Fish and Wildlife Service, Cookeville, Tennessee. March 17, 2011.
- Datillo, A. 2010. Email to Geoff Call, U.S. Fish and Wildlife Service, Cookeville, Tennessee. March 3, 2010.
- Georgia Department of Natural Resources, Wildlife Resources Division. 2005. A Comprehensive Wildlife Conservation Strategy for Georgia. Georgia Department of Natural Resources, Atlanta, Georgia. 202 pp. 14 Appendices.
- Kentucky Department of Fish and Wildlife Resources. 2005. Kentucky's Comprehensive Wildlife Conservation Strategy. KDFWR. Frankfort, Kentucky.
- Kentucky State Nature Preserves Commission. 2010. *Platanthera integrilabia* (White Fringeless Orchid) candidate Monitoring protocol at Mt. Victory Seeps (Frances Palk State Nature Preserve) 2010 update. Unpublished report to U.S. Fish and Wildlife Service, Atlanta, Georgia. 4 pp.
- Leur, C. A. 1975. The Native Orchids of the United States and Canada excluding Florida. The New York Botanical Garden. New York, New York.
- Lincicome, David. 2008. Tennessee Department of Environment and Conservation, Nashville, Tennessee. Personal communication with Robert Currie, U.S. Fish and Wildlife Service, Asheville, North Carolina. 2008.
- Littlefield, Tara. 2013. Email to Geoff Call, U.S. Fish and Wildlife Service, Cookeville, Tennessee. Botanist, Kentucky State Nature Preserves Commission. April 5, 2013.
- McCoy, Roger. 2008. Present status of the known *Platanthera integrilabia* occurrences in Tennessee. Unpublished report from Tennessee Division of Natural Areas to the U.S. Fish and Wildlife Service.
- McCoy, Roger. 2010. Email to Geoff Call, U.S. Fish and Wildlife Service, Cookeville, Tennessee. March 2, 2010.
- McCoy, Roger. 2012. Monitoring of select *Platanthera integrilabia* (white fringeless orchid) populations in Tennessee. Report to US Fish and Wildlife Service, Section 6, Segment 25. November 2012.
- Medley, Max E. 1980. Status Report on *Platanthera integrilabia*. Unpublished report to the U.S. Fish and Wildlife Service, Southeast Region. 34 pp.
- Miller, Stephen. 2008. U.S. Fish and Wildlife Service, Mountain Longleaf National Wildlife Refuge. Personal communication with Carolyn Wells, U.S. Fish and Wildlife Service, Asheville, North Carolina. 2008.

Miller, Stephen. 2010. U.S. Fish and Wildlife Service, Mountain Longleaf National Wildlife Refuge. Email to Geoff Call, U.S. Fish and Wildlife Service, Cookeville, Tennessee. March 17, 2010.

Mississippi Museum of Natural Science. 2005. Mississippi Comprehensive Wildlife Conservation Strategy. Mississippi Department of Wildlife, Fisheries and Parks, Mississippi Museum on Natural Science, Jackson, Mississippi. 418 pp.

Murdock, Nora. 2008. Email to Carolyn Wells, U.S. Fish and Wildlife Service, Asheville, North Carolina. November 6, 2008.

NatureServe Explorer. 2009. Summary report (PDF) for *Platanthera integrilabia*. Obtained from <http://www.natureserve.org/explorer/> on March 13, 2009.

Norquist, Cary. 2007. Email to Robert Currie, U. S. Fish and Wildlife Service, Asheville, North Carolina. March 9, 2007.

North Carolina Wildlife Resources Commission. 2005. North Carolina Wildlife Action Plan. Raleigh, North Carolina. 577 pp.

Patrick, Tom. 2012. Email to Geoff Call, U.S. Fish and Wildlife Service, Cookeville, Tennessee. February 15, 2012.

Patrick, T. S., J. R. Allison, and G. A. Krakow. Protected Plants of Georgia: An information manual on plants designated by the State of Georgia as endangered, threatened, rare, or unusual. Georgia Department of Natural Resources, Wildlife Resources Division.

Pittman, Bert. 2007. South Carolina Department of Natural Resources, Columbia, South Carolina. Personal communication with Robert Currie, U.S. Fish and Wildlife Service, Asheville, North Carolina. 2007.

Pittman, Bert. 2008. South Carolina Department of Natural Resources, Columbia, South Carolina. 2008. Personal communication with Robert Currie, U.S. Fish and Wildlife Service, Asheville, North Carolina. 2008.

Pittman, Bert. 2009. Email to Robert Currie, U.S. Fish and Wildlife Service, Asheville, North Carolina. January 29, 2009.

Pittman, Bert. 2009. Email to Geoff Call, U.S. Fish and Wildlife Service, Cookeville, Tennessee. March 2, 2010.

Richards, Matt. 2013. Email to Mincy Moffett, Georgia Department of Natural Resources, Social Circle, Georgia. Conservation Coordinator, Atlanta Botanical Garden, Atlanta, Georgia. April 3, 2013.

Schotz, Alfred. 2008. Email to Robert Currie, US Fish and Wildlife Service, Asheville, North Carolina. March 14, 2008.

Schotz, Alfred. 2011. Email to Geoff Call, U.S. Fish and Wildlife Service, Cookeville, Tennessee. March 16, 2011.

Schotz, Alfred. 2009. Email to Carolyn Wells, U.S. Fish and Wildlife Service, Asheville, North Carolina. February 9, 2009.

South Carolina Department of Natural Resources. 2005. South Carolina Comprehensive Wildlife Conservation Strategy 2005-2010. South Carolina Department of Natural Resources, Columbia, South

Carolina. 848 pp.

Shea, Andrea. 1999. Tennessee Department of Environment and Conservation, Nashville, Tennessee. Personal communication with Robert Currie, U.S. Fish and Wildlife Service, Asheville, North Carolina. 1999.

Shea, Margaret M. 1992. Status Survey Report on *Platanthera integrilabia*. Unpublished report to the U.S. Fish and Wildlife Service, Southeast Region. 152 pp.

Tennessee Wildlife Resources Agency. 2005. Tennessee's Comprehensive Wildlife Conservation Strategy. TWRA. Nashville, Tennessee. 231 pp.

Townsend, J. 2012. Email to Geoff Call, U.S. Fish and Wildlife Service, Cookeville, Tennessee. Virginia Department of Conservation and Recreation, Division of Natural Heritage. February 16, 2012.

United States Department of Agriculture, Forest Service. 2008. Federal Fiscal Year 2007 Monitoring and Evaluation Annual Report for the Revised Land and Resource Management Plan, Cherokee National Forest. Thomas Speaks, Jr., Forest Supervisor, September 2008. 97 pp.

Virginia Department of Game and Inland Fisheries. 2005. Virginia's Comprehensive Wildlife Conservation Strategy. Virginia Department of Game and Inland Fisheries. Richmond, Virginia. 717 pp. 16 Appendices.

White, Deborah. 1998. Site Conservation Plans for *Platanthera integrilabia* (White Fringeless Orchid). Unpublished report to the U.S. Fish and Wildlife Service, Southeast Region. 106 pp.

White, Deborah. 1999. Kentucky State Nature Preserves Commission, Frankfort, Kentucky. Personal communication with Robert Currie, U.S. Fish and Wildlife Service, Asheville, North Carolina. 1999.

White, Deborah. 2005. Kentucky State Nature Preserves Commission, Frankfort, Kentucky. Personal communication with Robert Currie, U.S. Fish and Wildlife Service, Asheville, North Carolina. 2005.

White, Deborah. 2007. Kentucky State Nature Preserves Commission, Frankfort, Kentucky. Personal communication with Robert Currie, U.S. Fish and Wildlife Service, Asheville, North Carolina. 2007.

White, Deborah. 2008. Kentucky State Nature Preserves Commission, Frankfort, Kentucky. Personal communication with Robert Currie, U.S. Fish and Wildlife Service, Asheville, North Carolina. 2008.

White, Deborah. 2009. Email to Carolyn Wells, US Fish and Wildlife Service, Asheville, North Carolina. January 26, 2009.

Wildlife and Freshwater Fisheries Division, Alabama Department of Conservation and Natural Resources. 2005. Conserving Alabamas wildlife: a comprehensive strategy. Alabama Department of Conservation and Natural Resources, Montgomery, Alabama. 322 pp.

Zettler, L. W. and J. E. Fahey, III. 1990. The status of *Platanthera integrilabia*, an endangered terrestrial orchid. *Lindleyana* 5:212-217.

Approval/Concurrence:

Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes;

the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve:



07/15/2013

Date

Concur:



10/28/2013

Date

Did not concur:

Date

Director's Remarks: